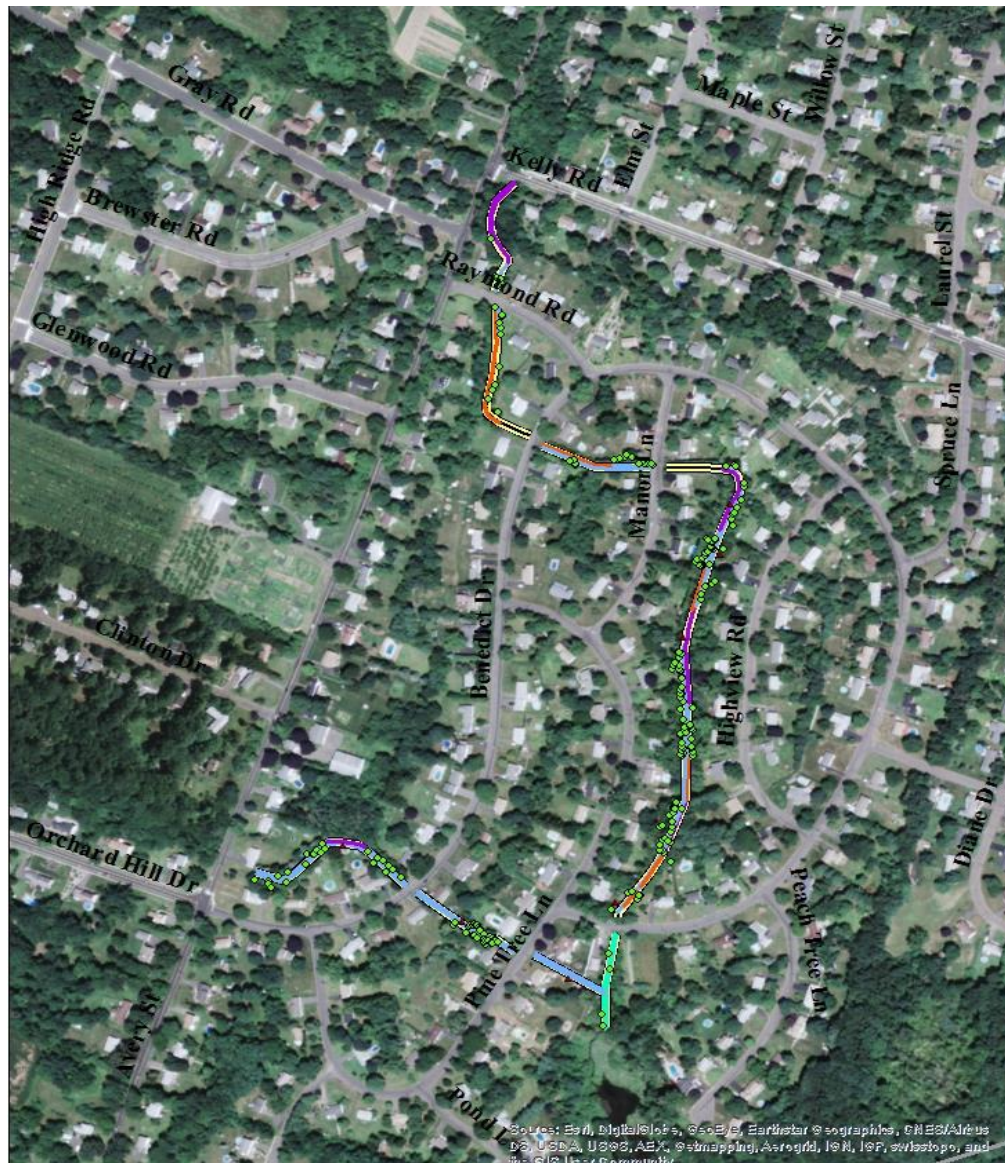




# South Windsor Department of Public Works Street Services



## VEGETATION MANAGEMENT PLAN AVERY BROOK CHANNEL, AVERY HEIGHTS 2016

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## **Section 1: Introduction**

South Windsor Department of Public Works, Street Services (DPW) has prepared this Vegetation Management Plan (VMP) to serve as a guide for the public, federal, state and municipal officials, vegetation management contractors and South Windsor DPW personnel. It is part of a growing set of document in a set of companion resources that guides vegetation maintenance activities at designated locations throughout the DPW system. This particular VMP contains the guiding principles and methods for managing vegetation along the Avery Street Storm drain channel.

Located in Avery Heights, the storm drain was built around 1980 to channel Avery's Brook through the expanding neighborhood (see map in Appendix 1). Approximately a mile long, this storm drain is primarily a concrete channel within a fifty-foot easement. A section of the area in consideration in this VMP from Benedict Drive to Moore's Pond is not in a concrete channel; the easement width is still fifty feet.

Over the years, vegetation including full size trees vines, herbaceous plant species, grasses and invasive plant species have taken over the channel which threatens the integrity of the channel structure. As a result, the DPW is instituting this plan to remove problematic plant species and to establish standards for both what types and/or where vegetation will not adversely affect the channel. This VMP, therefore, takes into consideration both the structure of the storm drain and its location in the back yards of the local neighborhood.

The DPW uses an industry standard Integrated Vegetation Management (IVM) approach to maintaining the storm drain that was developed, been utilized and has continuously evolved over the past fifty-years. These well-established arboricultural practices take into consideration the natural resources along the storm drain and the cultural use of the landscape by town residents.

The primary objective of this VMP is to document the most appropriate practices and procedures to control incompatible vegetation in a program that, over time, minimizes the need for and the impact of vegetation maintenance activities. Within this plan there are guidelines for removing the incompatible vegetation currently interfering with the proper function of the storm drain and a plan for future maintenance to protect the storm drain.

To achieve this goal, the primary ecological/plant communities the DPW is establishing, encouraging and supporting close to the concrete consists primarily of grasses and herbaceous vegetation. There are many types of acceptable early successional plant communities along the storm drain, including lawns, flower and vegetable gardens, wildflower patches or other compatible plantings. Tree and shrub species are acceptable when planted an appropriate distance from the storm drain depending upon the composition of their root structure. In all cases, once established these landscapes will help reduce the need for future intensive maintenance activities (see list of compatible plant species in Appendix 2).

For inquiries please contact Street Services at 1540 Sullivan Avenue, South Windsor, CT 06074, (860) 644-2511.

The requirements set forth in this VMP:

1. Are based on the results of an IVM survey performed by ISA Certified Arborists
2. Apply to routine maintenance
3. Are not intended for emergency maintenance and repair activities
4. Will be supervised by DPW personnel or their designated representatives to ensure all guidelines are followed
6. Will only be carried out by appropriately qualified, certified maintenance crews.

## Section 2.0: Integrated Vegetation Management<sup>1</sup>

The DPW's IVM program is based on well-established standards for managing vegetation following *The International Society of Arboriculture's* (ISA) Best Management Practices: Integrated Vegetation Management and *American National Standards Institute's* (ANSI) ANSI A300 Standards: Integrated Vegetation Management.

In brief, IVM is combining appropriate treatment options for the appropriate locations. To be IVM, these treatment option need to work together to maximize the unique advantages, while minimizing the disadvantages of each option or component and to be adaptable over time.

Mechanical and chemical controls are the direct IVM treatment methods used to remove targets. Appropriate use of these controls (removals, trimming, mowing, hand cutting and stump grinding, and foliar, cut-surface and basal herbicide applications) supports what is termed "Natural and Cultural Controls."

"Natural Controls", along the concreted portion of the storm drain the establishment of herbaceous plants and grasses within the first five feet from the edge of the storm drain and shrubs with controlled root systems from five to ten feet from the concrete. In this case, the term Natural Controls include "Culture Controls." As most of the storm drain is an integral part of people's back yards, the herbaceous plants and grasses includes planting lawns and vegetable, herb or flower gardens. Along the section of the storm drain from Benedict Road and Moore's Pond, "Natural Control" involves controlling shrub species under the trees.

In all cases, whether naturally or culturally created, plant communities inhibit the germination and growth of woody seedlings through competition (as maintained lawns and gardens or for light, moisture, nutrients), wildlife depredation (browsing/feeding) and possibly by allelopathy. These Natural and Cultural Controls" lower the dependence on chemical and mechanical controls. At the same time, long term natural controls on parts of the storm drain are only sustainable through the continued use of selective chemical and mechanical controls monitored by annual field reviews of the storm drain.

As the storm drain is an integral part of Avery Heights the DPW takes into consideration

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<sup>1</sup>For a more detailed discussion of the DPW's definition of IVM please see "Section 2.0" in the *South Windsor Department of Public Works, Pollution Control Division (DPW) Sanitary Sewer Easement VMP* located at: [http://www.southwindsor.org/sites/southwindsorct/files/uploads/south\\_windsor\\_department\\_of\\_public\\_works\\_online\\_vmp.pdf](http://www.southwindsor.org/sites/southwindsorct/files/uploads/south_windsor_department_of_public_works_online_vmp.pdf).



the built environment when planning vegetation management activities. To clarify with a simple example, a perennial flower garden might remove the need for additional maintenance, but the town still needs to be able to access the gates along the fence and needs to monitor any changes in the maintenance of the property over time. This means not planting vegetation right in front of the gate and not planting any perennial vines or shrubs within five feet of the channel or trees within at least 10 feet of the channel.

This plan also takes into consideration cultural beliefs about landscape aesthetics and an understanding of the time involved in establishing a fully integrated vegetation maintenance program at the site. This is an important factor particularly during the second phase of treatments where thirty-plus years of trees, some shrubs, vines and invasive plant species need to be cleared. In all cases the resulting landscape will immediately look cleaner and less cluttered. In some locations, the use of stump grinders will open the area to landscaping activities almost immediately. In other cases, the final results will be established over the course of a few years. The benefits of IVM will be felt most clearly in areas where if the DPW continues to only mechanically clear incompatible vegetation, the long term result would be to multiply the already existing uncontrolled resprouts (with very few exceptions, woody plants when cut send up 4,5,6,7, etc. sprouts each time they are cut from each stem) and invasive plant species (See Illustration 1).



Illustration 1: Resprouts and Invasive Plants in the StormStorm drain interfering with the integrity of the joints

## **Section 3.0: Implementing IVM**

Recognizing the need to manage the vegetation in the storm drain, the DPW initiated the process by employing the services of ISA (International Society of Arboriculture) certified arborists to conduct a vegetation survey of the storm drain. This survey was completed on July 27<sup>th</sup>, 2016.

### **3.1: TREATMENT PHASES**

As a result of this survey, the DPW has divided the vegetation management treatment plan for the storm drain into four phases:

**Phase 1:** An herbicide application to the concrete portion of the easement within the channel. All herbicide applications will be completed by individuals holding the appropriate Connecticut pesticide license(s), following all state and federal pesticide laws and regulations. Areas of heavy Baltic Ivy and Pachysandra that extends into managed yards will first be cut along the top edge of the concrete drainage system to prevent off-target damage to landscape plants. This phase should be completed as soon as possible.

**Phase 2:** Clearing ten feet back from the top of the concrete channel to remove incompatible vegetation including trees & shrubs with large root systems, and state listed invasive plant species. Note that, planted shrubs with shallow roots within five feet of the concrete will not be removed if at all possible and if they do not affect the integrity of the concrete channel. They may be removed in the future if they start to cause damage to the storm drain. Along the non-concrete section, only shrubs extending into the channel and large trees that have fallen over the channel will be removed and healthy trees will remain in place. This phase includes treating under four-inch diameter stumps with herbicides to prevent re-sprouts. Phase 2 should be done when the ground is frozen.

**Phase 3:** Restoration of cleared yard areas including stump grinding, loaming and seeding because trees were removed, replacement of fencing that was damaged prior to and during clearing operations, cleanup of access points, and replacement plantings where agreed to with landowners. Phase 3 should be during the spring after the Phase 2 is completed.

**Phase 4:** Phase 4 is not technically a vegetation maintenance activity but is part of the DPW's regular maintenance program. Phase 4 is a physical control component of this IVM program, or general maintenance tasks that help prevent the establishment of vegetation. These include, maintaining cracks, general repairs and cleaning the accumulated dirt from the storm drain.

**Phase 5:** Maintenance of the concrete channel, cleared areas of the ten-foot easement not maintained by landowners, and fences using the appropriate herbicide and mechanical treatment methods. Should generally be completed when the water levels are the lowest; generally, August/September. Recommended on a biannual basis, but treatment schedule may be expanded to three year or contracted to one year depending upon the results of an annual monitoring program.

### **3.2: PHASE 2 DETAILS**

Phase 2 is the treatment phase with the largest impact on the landscape. As such, it requires a more detailed description of the activities involved in the process.

Phase 2 is effectively a land clearing operation with clearly defined specifications about treatment areas that run along the channel:

#### **3.2.1: Preparation**

Prior to the start of land clearing operations, pre-work conditions will be documented in two stages. The first stage, a vegetation survey was already completed on July 27<sup>th</sup>, 2016 (see Maps in Appendix 1). Immediately prior to the land clearing, the DPW or its designated representative will re-survey and photograph the conditions in each yard while flagging the trees slated for removal. This will serve as the information used in Phase 3: Restoration.

#### **3.2.2: Land Clearing in Non-Yard Areas**

All trees, invasive plants, and shrubs will be removed ten feet from the top of the concrete channel. No stump grinding will be done in these areas. Tree stumps will be treated with herbicide to prevent resprouts.

#### **3.2.3: Land Clearing in Yard Areas**

All trees and invasive plants will be removed within the easement, ten feet from the top of the concrete channel. Incompatible shrub species within five feet of the concrete channel





Illustration 2: Condition of the Fence Line

will be removed from the easement.

Stumps less than four inches in diameter will be flush-cut with the ground and treated with herbicides to prevent resprouts.

Note: existing planted shrubs with shallow roots within five feet of the concrete will not be targeted for removed at this time if they do not affect the integrity of the concrete channel.

To protect the integrity of the storm drain and for worker safety, some planted shrubs within the ten-foot easement may need to be removed if they interfere the planned clearing work. These planted shrubs may also need to be removed in the future if they start to cause damage to the storm drain.

No shrubs (including roots) may be planted in the future within five feet of the concrete and those planted between five to ten feet must from the list of compatible shrub species or as agreed upon by the DPW (see Appendix 2).

#### **3.2.4: Hedges**

Existing shrub hedges including arborvitae will be reviewed by the town and arborist where necessary to determine if they will be compatible with the concrete channel. Note: species and distance from concrete will be contributing factors.

#### **3.2.5: Special Note on Equipment**

Equipment for the clearing project will need to be able to operate within the limits of the concrete channel. The equipment will need to be smaller in size, exert minimal ground pressure and be either rubber tracked or have rubber tires to prevent damage to the channel.

### **3.3: PHASE 3 DETAILS**

Phase 3 is the restoration phase of the project. With the current plant growth along the storm drain, the removal of the incompatible vegetation will result in the need to restore cleared yard areas including stump grinding, loaming and seeding; to replace fencing damaged prior to and during clearing; the need to clean-up access point, and where agreed to with landowners, the replacement of plantings.

#### **3.3.1: Stump Grinding**

Tree and shrub stumps larger than four inches in diameter will be ground a minimum of six inch below grade and the area will be restored to pre-work conditions which includes being loamed and seeded where appropriate.

### **3.3.2: Stump Removals**

Select stumps will be marked in the field and will be fully removed as they are currently growing into the concrete and/or along the edge of the concrete to stop their root system from further damaging the concrete channel. The resulting void will be filled with the appropriate gravel fill and where appropriate topped with loam and then seeded. Note: work will be done by appropriately skilled operators to prevent further damage to the concrete channel.

### **3.3.3: Plantings**

Future shrub and tree planting may be discussed with individual landowners where yards have been exposed by the removals within the 10-foot easement along the top edge of the concrete channel. Replacement trees will only be placed outside the ten foot cleared area. Replacement shrubs will only be placed a minimum of five feet (including roots) from the edge of the channel. (List of compatible plant species is located in the Appendix 2).

### **3.3.4: Lawns**

During the process of Phase 2 clearing work, there may be unavoidable damage to lawn areas which will be restored to pre-work conditions in Phase 3.

### **3.3.5: Fence Line**

Currently, sections of the existing fence are engulfed in vegetation and some of it has already been damaged by vegetation (see illustration 2). In other sections, the fence will need to be opened up in many places to provide for access to the project area and yards. As a result, a large portion of the fence will need to be either repaired or replaced after the clearing and restoration portions of the project.

## **3.4: PHASE 5 AND MONITORING**

Future maintenance will include annual monitoring of vegetation conditions within the entire fifty-foot easement of the storm drain and instituting the recommendations above in Phase 5 as the regular maintenance program for the channel.

The annual monitoring program will be to both the channel and to the ten-foot area from the edge of the concrete, and ten feet from the edge of the non-concreted section. Monitoring will

be of both planted and natural vegetation. The goal of the monitoring is to protect the storm drain from future damage and to minimize the need for future maintenance activities.

Part of the monitoring will also be to adjust the timing and type of future maintenance activities. The current recommendation is to treat the concrete channel, fences and cleared areas in the ten-foot easement not maintained by landowners on a biannual basis. Monitoring could result in either reducing this to an annual program or a three-year program. In all cases, this will actually reduce the amount of herbicide or the intensity of any future mechanical maintenance activities by taking care of incompatible vegetation before it becomes a problem because of its size, density, location (e.g. in cracks, vines on fences, etc.) or because it is invasive plant species.

## **Section 4.0: Compatible and Incompatible Vegetation**

Pursuant to the policy and intent set forth in this VMP, all vegetation must be removed that obscures the storm drain and interferes with the integrity of the concrete structure; this is known as incompatible or target vegetation. As a rule, within the 10-foot easement on the edges of the storm drain the targets are woody vegetation species; tree, shrub and vine species. The other primary target is noxious vegetation including poisonous and invasive plant species. Within the storm drain, all vegetation is a target.

### **4.1: TREES AND SHRUBS**

1. All tree and shrub species are considered targets within the concrete channel and within the 10-foot easement up to five feet from the edge of the concrete (0-5').
2. Shrubs are compatible and are, therefore, not primary targets between five and ten feet from the edge of the concrete (5-10') unless they interfere with access to the gates.
3. On a case-by-case basis, planted shrubs with shallow roots may be left within the 0-5' zone unless/until they threaten the structure of the concrete channel.
4. Only shrubs—not trees—are targets within the 10-foot easement of the non-concreted section of the storm drain.

### **4.2: HAZARD TREES**

Trees that are in poor structural condition whereby they may be in danger of falling on the easement or from the easement and cause a dangerous situation or damage. For examples, trees damaged by lightning, pests or disease. Also vegetation with root systems that have the potential to penetrate or otherwise cause an emergency situation; for example, tree and shrub roots growing under and through the concrete, and vines covering the concrete. This includes trees outside the easement. Note: Any trees outside the easement will only be removed after consultation and with permission of the landowner.

### **4.3: LIMBS AND BRANCHES**

Not all limbs and branches of trees planted outside the 10-foot easement along the concrete section of the storm drain and within the 10-foot easement along the non-concreted section are incompatible. These structural components of woody vegetation are targets when they obscure the storm drain or are a hazard due to damage, disease or age related weakness.

#### **4.4: VINES AND BRAMBLES**

Vines and brambles can obscure the storm drain and can make it difficult too impossible to access it. For example, two of the primary plant species that fit into this category are Oriental Bittersweet and Multiflora Rose; both are considered invasive plant species by the State of Connecticut, and both are discussed under Section 4.5 *Invasive Plant Species*. Impenetrable thickets of blackberries, raspberries and black raspberries are also targets. Note: vines include planted vines which may not be within the 10-foot easement; planted brambles must not obscure, reduce access to, or be planted on the fence line or access gates.

#### **4.5: NOXIOUS VEGETATION**

Noxious Weeds are defined by the federal *Plant Protection Act* as: "...any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment." This includes both poisonous and invasive plant species.

**4.5.1: Poisonous Plant Species** are plants that may cause allergic reactions when touched or ingested. These include, but are not limited to: Poison Ivy and Poison Sumac. These plant species are a hazard to landowners, DPW personnel and contractors.

##### **4.5.2: Invasive Plant Species:**

Invasive plant species pose a significant threat to the natural diversity of native plants, invertebrates and vertebrates. Invasive plants are characterized by their ability to spread extremely rapidly, especially in disturbed areas, along watercourses and ROW corridors. Typically, invasive plants possess one or more of the following characteristics: aggressive growth and maturity; spread quickly by seed and/or rhizomes; have few or no natural pests or diseases; tolerate or thrives in many environments, and can be difficult to remove or control.

Invasive plant species commonly found in South Windsor, include, but are not limited to:

1. Oriental Bittersweet
2. Multiflora Rose
3. Norway Maple
4. Buckthorn
5. Honeysuckle
6. Autumn Olive



#### **4.5.3: Resources**

1. Connecticut Invasive Plant Working Group:  
<http://cipwg.uconn.edu/>
2. Connecticut's Current Invasive Plant List:  
<http://cipwg.uconn.edu/2014/12/30/invasive-plant-list/>
3. USDA, Natural Resources Conservation Service, Introduced, Invasive, and Noxious Plants webpage:  
<https://plants.usda.gov/java/noxiousDriver>
4. USDA, National Agricultural Library, National Invasive Species Information Center (NISIC) webpage:  
<http://www.invasivespeciesinfo.gov/index.shtml>

#### **4.6: PLANTED AND COMPATIBLE VEGETATION**

Within the ten-foot easement from the edge of the concrete channel, compatible vegetation consists primarily of grasses and herbaceous plants, either natural or planted. Note: as discussed above, no vegetation may obscure or grow over the fence line and/or inhibit access to the gates or the channel.

Compatible vegetation along the concrete channel is as follows:

1. From 0-10' from the top of the concrete channel
  - a. Wildflowers (natural and planted)
  - b. Low-bush blueberries
  - c. Vegetable Gardens
  - d. Flower Gardens
  - e. Herb Gardens
  - f. Herbaceous perennial "hedges" (e.g. daylilies, hostas, etc.)
2. From 5-10' from the concrete channel:
  - a. Shrubs from the approved list in Appendix 2
3. The only restriction outside the easement is to please not plant Willow trees.

## **SECTION 5.0: INTENDED VEGETATION TREATMENT METHODS**

The following is a descriptive listing of the DPW's intended vegetation management methods detailing the individual techniques available. The application of the individual treatment methods is based on the results of the IVM survey conducted in July 2016, site sensitivity, regulatory mandates, target species composition, density and height, site access and topography. This is only a guideline for DPW personnel and contractors. Therefore, as long as the contractors are complying with the treatment specifications, all applicable federal, state and municipal laws and regulations, and this VMP, the DPW may approve variations with the exact equipment utilized.

***The following procedures will be implemented during all vegetation maintenance activities:***

1. In advance of non-emergency treatment activities, the DPW will notify easement holders.
2. During this notification process, the DPW will also discuss the need to remedy situations where vegetation has been planted in the easement and its effect on the storm drain and access.
3. All contractors will comply with appropriate regulations, and licensing requirements
4. All contractors will comply with applicable ANSI standards including, but not limited to Z-133 (*Arboricultural Safety Standards*), A-300 parts 1-9 (tree care practices).
5. Access will be through the use of established roadways or access points whenever possible. Note: during Phase 2, parts of the fences will be removed.
6. When applicable, permission to enter the easement and channel by any other means must be obtained from the landowner.
7. Unreasonable site damage or destruction during any phase of the vegetation management operation by the contractor, his agents or employees, must be repaired.

### **5.1 MECHANICAL CONTROLS**

Mechanical controls are the physical removal of the stem and branches of vegetation by cutting, chopping or mowing, usually leaving the root system intact. These include removals, hand cutting, brush mowing, field mowing, lawn mowing, side trimming, chipping and stump grinding. Treatment activities will include the selective removal of target species, branches that overhang the 10-foot easement and with permission, danger or hazard trees outside of the 10-foot easement.

***As a key component of this IVM program, mechanical methods are used:***

1. To control areas of thick, tall and sometimes impenetrable vegetation that restricts access to the channel, often followed up with herbicide applications to the resulting resprouts (removals, brush mowing).
2. To remove hazard and danger trees.
3. For side trimming.
4. In preparation for selective foliar applications.
5. In conjunction with cut surface treatments (CST).
6. To support the maintenance of compatible vegetation.

***The following guidelines are observed in all mechanical operations:***

1. Mechanical controls are used in preparations for chemical controls.
2. Areas too saturated to support mowing equipment are hand-cut.
3. Equipment access through wetlands or over waterbodies will be avoided as much as practicable by utilizing existing public or private access roads and permanent stream crossings whenever possible.
4. Equipment mats (or equivalent for equipment support) will be used everywhere appropriate including, but not limited to areas where saturated soils are present and on lawns if necessary.
5. Mowing/removals contractors are expected to repair any rutting or significant damage to wetland or waterbody banks and vegetation immediately following completion of maintenance activities.
6. Any areas of significant soil disturbance will be stabilized and allowed to re-vegetate immediately following completion of maintenance activities.
7. All mechanical equipment is expected to be in sound operating condition.
8. Treatment crews will have petroleum spill kits available.
9. Special Note on Equipment: Large types of mechanical equipment will need to be able to operate within the limits of the concrete channel. The equipment will need to be smaller in size, exert minimal ground pressure and be either rubber tracked or have rubber tires to prevent damage to the channel.

## **5.2 MECHANICAL METHODS**

**5.2.1: Hand Cutting** is the use of hand-held saws to remove the stem and/or branches from the plant's root system. Hand cutting is used to remove hazard trees; target vegetation generally greater than twelve feet tall; to protect sensitive areas, and where herbicide use is prohibited. Hand cutting is also used on sites where terrain, target species size or sensitivity renders mowing impossible or impractical. Hand cutting may be used at any time of the

year. Removals include hand cutting.

***The following guidelines are observed during cutting operations:***

1. Target vegetation is cut as close to the ground as practical with stump height usually no higher than root swell.
2. Slash will be chipped and hauled to an appropriate off-site location unless by request the landowner want the chips (following state invasive species statutes and regulations).

**5.2.2: Brush Mowing** is the cutting, severing or shattering of vegetation by large rotary or flail mowers. Heavy-duty mowers, usually ranging from five to eight feet wide, are typically mounted on four-wheel drive rubber tired tractors or tracked vehicles. Brush mowing is used where target stem densities are high and stems are tall, but not in areas where stem diameters and heights exceed the ability of the mowing equipment. In other words, brush mowing is used in areas in which stem size is up to three inches in diameter in medium to dense stands of targets. It is only appropriate where terrain, site size and sensitivity permit the efficient use of the equipment. Mowing may be used at any time of the year except when deep snow precludes operations. NOTE: At this time Brush Mowing is not likely to occur within the storm drain, but is included just in case the need arises in the future.

***The following guidelines are observed during brush mowing operations:***

1. Mowing height is no higher than six inches unless required by regulation.
2. Operators must perform daily integrity inspections of hydraulic systems and carry petroleum spill control equipment on the mowing machines.
3. Operators must use designated access routes.
4. Mobile equipment shall not pass over residential lawn areas before landowner notification.
5. Hand cutting will be used in areas where mowing is restricted by terrain conditions such as steep, rocky sites, wet soils, or next to obstructions such as stone walls and fence lines.
6. Extreme care must be exercised to insure the safety of the general public as brush mowers can throw large chips and debris great distances from the cutting equipment. When appropriate personnel will be employed to prevent people and animals from coming too close to the work site.

**5.2.3: Side Trimming** is the trimming or removal of encroaching tops and/or branches of trees growing on or near the storm drain which may cause a hazard, hamper access and/or impede visual inspections. Side trimming is accomplished by the use of an aerial lift mounted on a street or off-road vehicle, and/or tree climbing. This method helps maintain

the edge definition of the easement where it is surrounded by trees allowing for easier access for inspections, maintenance activities and emergencies. All trimming activities are performed in accordance with proper arboriculture practices and in compliance with all applicable regulations to insure the health and aesthetic value of the trees. This method may be used any time of year except when deep snow precludes operations.

**5.2.4: Removals** are the removal of trees with stem diameters above three inches. Removals include anything from the removal of a single tree to land clearing/logging type operations where the channel is impacted by tree growth (with shrubs and invasive plant species mixed in). The equipment used in removals includes chain saws, truck or skid-steer mounted aerial lifts, tree shears, grapples, chippers, stump grinders, etc. This method may be used any time of year except when deep snow precludes operations.

**5.2.5: Chipping** is the process of turning woody vegetation into small 1-2" by ½" pieces using wood chippers. This method is used in conjunction with all mechanical operations except mowing which itself converts vegetation into small pieces (it is used in areas where hand cutting is used in brush mowing operations). As a rule, chips will be removed from the site. Only in agreement with the landowner will chips be left or scattered outside the boundaries of the easement. This method may be used any time of year except when deep snow precludes operations.

**5.2.6: Stump Grinding** is the process of grinding the stumps with a piece of landscaping equipment appropriately called a "Stump Grinder." Stump grinding is used on large woody vegetation in areas where it might cause a hazard or for aesthetic reasons. The stumps are usually ground to six inches below grade and the area may be loamed and seeded. It is used in conjunction with removals and hand cutting and may be used any time of year except when deep snow precludes operations. Always call *Call Before You Dig* (CBYD) before all stump grinding operations.

**5.2.7: Lawn Mowing** will take place on parts of the easement not maintained by landowners where lawns are established using homeowner or professional lawn mowers.

### 5.3: CHEMICAL (HERBICIDE) CONTROLS

Chemical controls are the application of herbicides to the foliage, stems and/or root zone of vegetation to suppress growth and achieve root control. These include foliar, basal and cut stump surface treatments.

#### 5.3.1: Herbicide Applications contribute to this IVM program because:

1. They reduce site disturbance, particularly selective herbicide applications.
2. The entire target plant, *including the roots*, is controlled, stopping their spread by resprouts, adventitious root suckering and/or rhizomes.
3. They increase the length of time between treatment cycles by reducing the recurrence and stem counts of target vegetation.
4. They minimize the amount of manpower and equipment and their repeated impact on the environment.

As a rule, the DPW will choose herbicide formulations that, when used appropriately, are low in acute toxicity, are not known to bio-accumulate and, as applied, have a short half-life with low soil mobility.<sup>2</sup> These formulations are applied using the most selective methods possible for the situation. Anti-drift adjuvants are required to accommodate changes in wind velocity. Applications are also not made in situations when there is a reasonable expectation that herbicides might drift from the target, or during measurable precipitation. The DPW, however, reserve the right to use other appropriately labelled herbicides on a case by case basis if necessary.

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<sup>2</sup>USDA, 1984; USEPA. Environmental Stewardship Strategy for Electric Utility Rights-of-Way, Pesticide Environmental Stewardship Program, Edison Electric Institute Vegetation Management Task Force, August 1996; Massachusetts. 333 CMR 11.00, Right of Way Management; K.H. Deubert. Studies on the Fate of Garlon 3A and Tordon 101 Used in Selective Foliar Application in the Maintenance of Utility Rights-of-Way in Eastern Massachusetts, Final Report prepared for New England Electric et al., 1985; Harrison Biotech, Inc. A Generic Environmental Impact Report on the Control of Vegetation on Utility and Railroad Rights-of-Way in the Commonwealth of Massachusetts, Final Report prepared for the Department of Food and Agriculture, Commonwealth of Massachusetts, 1985; N.H. Nickerson, G.E. Moore and A.D. Cutter, Study of the Environmental Fates of Herbicides in Wetland Soils on Electric Utility Rights-of-Way in Massachusetts over the Short Term, Final Report prepared for New England Electric et.al., December 1994; Massachusetts Department of Agricultural Resources. Surface Water Monitoring of Glyphosate used in Rights-of-Way Railroad Vegetation Management (2005–2006), Report, November, 2006.



**5.3.2: The following guidelines are observed in all herbicide applications:**

1. Herbicide applications follow all federal and state regulations and any required permits.
2. The DPW will only approve herbicides registered with and approved by the U.S. Environmental Protection Agency (EPA) with low toxicity to non-target plants and animals.
3. Application of herbicides will be in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).
4. Application of herbicides will be in accordance with all applicable regulations promulgated by the State of Connecticut including the Pesticide Control Act.
5. Following the Connecticut *Use of Pesticides* Section 22a-66.1-7 regulations, herbicides will be used in strict accordance with the manufacturer's EPA approved label.
6. At least one individual from any company applying herbicides must hold a Supervisory Certificate issued by the Connecticut Department of Energy and Environmental Protection (DEEP) in the appropriate categories listed in the specification.
7. All herbicide applications will be performed by qualified, experienced, trained vegetation management maintenance crews (see Section 6).
8. Mixing will take place according to all labeled restrictions.
9. Mixing will only be performed at a DPW or the contractor's facility.
10. The contractor is responsible for the proper disposal of all excess materials and solutions in accordance with all applicable federal and state laws, regulations and guidelines.

**5.4: HERBICIDE METHODS**

All Herbicide methods will be applied as selectively as possible.

**5.4.1: Foliar:**

The application of herbicides to fully developed leaves, stems, needles or blades of a plant.

1. The herbicide concentrate is usually mixed or diluted with water and applied as a uniform spray over the plant's foliage.
2. Equipment includes:
  - a. Back pack sprayers
  - b. Vehicle mounted sprayers parked on the road.
3. Treatments use low pressure, below 60 pounds per square inch (psi) at the nozzle, for applications.

4. This technique is generally the most economical and effective method used:
  - a. In medium and high brush densities
  - b. To control invasive and poisonous vegetation.
5. The application period usually extends from early June through the beginning of leaf abscission in the Fall, when not restricted by regulations.

**5.4.1.1: Low Volume Backpack Foliar Applications** utilize hand-operated pumps or motorized, backpack sprayers.

1. Hand-operated pumps deliver an herbicide(s) mix in a stream of water from a three to five-gallon spray tank.
2. Motorized, backpack sprayers produce an air current that delivers the herbicide(s) mix in small droplets from a portable three to five-gallon spray tank.
3. Both techniques require the applicator to *only dampen or lightly wet* the target leaf area; not to the point of runoff. This minimizes herbicide drip from target species onto ground cover.

**5.4.1.2: Vehicle Mounted Applications** generally utilize a hydraulic sprayer mounted on a truck, tractor, off road or tracked vehicle equipped with hand-held spray guns.

1. The herbicide mixture is directed at targeted vegetation or broadcast for uniform coverage.
2. Specially designed nozzles can reduce spray volumes and limit droplet fines thus reducing the potential for spray drift off-target.
3. Nozzles can deliver effective spray coverage at relatively low spray pressures of 60 psi and less.
4. This technique is capable of delivering uniform, penetrating spray coverage too dense, tall, target vegetation.

**5.4.1.3: The following guidelines are observed in all foliar applications:**

1. Anti-drift agents are added to the mix or solution to reduce the potential of herbicide drift beyond target vegetation. Drift control agents reduce the break-up of sprays into fine droplets and offer increased selectivity, leaf tissue penetration, and herbicide deposition on target plants.
2. Foliar applications are not made:
  - a. To target vegetation too tall to effectively treat/cover the canopy
  - b. To target vegetation that would jeopardize the selectivity or sensitivity of the site
  - c. During periods of wind, which are strong enough to bend the tops of the main stems of mature tree species on site

- d. During periods of moderate or heavy rain fall (where leaf runoff can wash the herbicide off the target plants—light rainfall can be fine if following the product label(s))
- e. Before moderate to heavy rain fall, follow the product label(s).

#### **5.4.2: Cut Stump Surface Treatments (CST)**

The application of an herbicide mix in water, basal oil or a non-freezing agent directly to the cut surface of a stump immediately following or during a cutting operation to prevent resprouts and root suckering.

1. Application equipment includes:
  - a. low-volume, backpack, hand-pump sprayers
  - b. hand held squirt bottles
  - c. paintbrushes
  - d. sponge applicators.
2. It is only necessary to treat the phloem and cambium tissue, regardless of the stump diameter.
3. Ideally treatment should be to freshly cut stumps.

##### **5.4.2.1 The following guidelines are observed in all CST applications:**

1. CST is used:
  - a. To reduce the visual impact of vegetation management treatments
  - b. For its selectivity to protect desirable vegetation
  - c. To treat target vegetation with herbicides in areas where other methods are not appropriate due to the time of year of site sensitivity
  - d. At any time of the year.
2. CST is best avoided:
  - a. During the season of high sap flow
  - b. In moderate to heavy stem densities.
3. CST is not used:
  - a. In moderate to heavy rains
  - b. In deep snow that prevents hand cutting
  - c. In chemical restricted areas.

**5.4.3 Low Volume Basal Treatment:** a selective hand-pump backpack sprayer application of an herbicide diluted in specially formulated oil, to wet the entire lower 12-18” of the main stem of target vegetation; the oil enables the herbicide solution to penetrate the bark tissue and translocate within the plant.

***5.4.3.1 The following guidelines are observed in all Low Volume Basal applications:***

1. Low volume basal treatments are extremely selective and used:
  - a. When vegetation density is low
  - b. In areas where extreme selectivity is necessary
  - c. Any time of year, including in the dormant season when foliage, grasses and herbaceous plant are not obstructing the main stem.
2. Low volume basal treatments are not used:
  - a. During periods of rain or when stems are wet
  - b. In deep snow that prevents treating the lower 12-18” of the main stem
  - c. In chemical restricted areas.

## **6.0: VEGETATION MAINTENANCE BEST MANAGEMENT PRACTICES**

In essence, this entire VMP is the Best Management Practices (BMP) for vegetation maintenance activities at the storm drain; this being said, it is necessary to include some more detailed BMP's for both DPW and contract personnel. Section 6, therefore, includes contractor qualifications; operational guidelines; directions on required paperwork; an outline of the notification process, and a listing of paperwork/information contractor(s) need to complete the work to the appropriate standards. This section does not include BMP items found throughout this VMP, but it shall be understood that they are part of the Vegetation Maintenance BMPs. The DPW further expects all contractors to follow appropriate industry standard BMPs for their particular field of expertise and equipment specifications (land clearing, side trimming, brush mowing, herbicide applications, etc.).

### **6.1: QUALIFICATIONS**

The contractor must demonstrate:

1. The ability to comply with all applicable federal and state laws and regulations.
2. The ability to comply with all industry standards.

The contractor must provide:

1. Qualified, experienced supervisor and foreman.
2. Supervisors and foreman that understand all aspects of the contracted vegetation maintenance activities and who are responsive to the guidance of the DPW.
3. Supervisors/foreman who effectively manage crews to ensure the satisfactory completion of the contract.
4. Supervisors/foreman who effectively communicate with the public using professionalism and courtesy.
5. Appropriately licensed or certified field supervisors/foreman.
6. Personnel applying herbicides must hold a Connecticut Operator's pesticide license and must work under the on-site supervision of a Supervisory Certificate applicator in the appropriate category(s).
7. Qualified, experienced and/or trained field crews with appropriate licenses and/or certifications. "Qualified" means crew personnel:
  - a. Trained to recognize and identify incompatible target *and* compatible vegetation
  - b. Knowledgeable in the safe and proper use of mechanical and chemical equipment and methods.
8. Field crews that conduct themselves professionally at all times.

9. Equipment that meets all specifications required to complete the contracted vegetation maintenance activity(s).
10. Equipment maintained at the highest practical level of efficiency and effectiveness.

## **6.2: OPERATIONAL GUIDELINES**

The DPW sets forth the following set of operational guidelines. This set of guidelines does not preclude additional guidelines found throughout this document, or additional industry standards and regulations not included in this section. It is merely a guideline of the minimum standards required of all contractors working under this VMP.

### **Supervision/Responsibility**

1. The following individual is responsible for monitoring, supervising and coordinating vegetation management programs:

Vincent Stetson  
South Windsor, CT 06074

2. The DPW will inform the contractor(s), the range of treatment dates and the possible methods, materials and mixing rates. The DPW will supply treatment restrictions data, maps and written instructions outlining any special treatment considerations or instructions.
3. No work will begin until the contractor has the appropriate data, permits, restriction lists, mixing rate instructions and licensed staff.
4. Both the Contractor and the DPW are responsible to ensure that vegetation maintenance operations are conducted in a professional, safe, efficient manner, with special attention directed towards minimal environmental impact and property owner concerns.
5. All operations will be supervised by DPW personnel or their designated representatives through regular inspections and these individuals have the right to prescribe corrective steps where necessary.

### **Equipment**

6. Instead of dictating the exact equipment models and calibration methods—except as it affects the concrete channel—The DPW recognizes the vast variety and performance of mechanical and herbicide application equipment, therefore:
  - a. The contractor shall provide the most appropriate application equipment, calibrated to effectively and legally control target vegetation
  - b. The DPW reserves the right to inspect all equipment.



## **Safety**

7. Contractors shall strictly adhere to all mandated safety precautions directed towards the public, the applicator and the environment.
8. Contractors shall follow all current, applicable ANSI standards for their particular vegetation maintenance operation; at a minimum, these include, but are not limited to Z-133 *Safety Standard* and A300 *Integrated Vegetation Management – Part 7*. Most applicable ANSI standards related to this VMP can be found at the [www.ISA-Arbor.com](http://www.ISA-Arbor.com).
9. Proper Personal Protective Equipment shall be worn during all operations
10. Proper Connecticut roadside visibility procedures, equipment and clothing will be used at all times.
  - a. Per section 11.3 of the *Utility Accommodation Manual CT DOT*:

All workers within the right of way of a highway who are exposed to either traffic or to construction equipment shall wear high-visibility apparel. High-visibility safety apparel means personal protective safety clothing that is intended to provide worker conspicuity during both daytime and nighttime usage. The clothing shall meet the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled American National Standard for High-Visibility Safety Apparel and Headwear. (<http://www.safetyequipment.org/hivisstd.htm>).

## **Roadside**

11. Roadside Traffic Control: Contractors will comply with the traffic control plans included in
  - a. the *Utility Accommodation Manual CT DOT* located at: <http://www.ct.gov/dot/lib/dot/documents/dutilities/ACCOMODATION.pdf> .and
  - b. *State Traffic Commission Regulations* Page 53 Part IV *Traffic Control for Highway Construction and Maintenance* located at: <http://www.ct.gov/dot/lib/dot/documents/dstc/part4.pdf>.

## **Treatment Method Requirements**

12. Herbicides shall be handled and applied only in accordance with the manufacturers' labeled instructions.
13. Crews shall at all times, exercise good judgment and common sense and shall immediately cease operations if adverse conditions or other circumstances warrant.
14. In locations where individual restrictions or procedures overlap and/or multiple restrictions apply, the more stringent restrictions and all applicable procedures shall be employed.
15. Impact mitigation measures shall be implemented during routine vegetation maintenance operations and when possible during emergencies.
16. Crews shall exercise care to ensure that low-growing compatible vegetation and other non-target organisms are not unreasonably affected (within the constraints of the treatment method).

17. If less than the desired control is achieved per the contract specifications, the contractor will be held responsible to re-treat or remove the remaining vegetation to The DPW's satisfaction.

### **Easement Boundaries**

18. Easement Boundaries will be marked/confirmed in the field prior to treatments by trained professionals using all appropriate documentation.

### **Property**

19. As a courtesy, knock on landowner's doors when working through the area.
20. Permission must be obtained for ingress and egress if entering from private land.
21. Always politely make sure when receiving permission for ingress, egress, treatments, etc. over/on property on or off the easement, that the individual involved has the right to give these permissions (landowner, business owner, etc.).
22. Follow all BMP's in Sections 5 & 6 about easements, permissions, etc.
23. All gates shall be immediately closed.
24. Exercise care to prevent the rutting or destruction of roadways, fields or any other form of access.
25. No litter of any kind will be left on the site or adjoining property.

### **Landowners**

26. Land owners shall be treated with courtesy and respect at all times.
27. When addressing inquiries or complaints:
  - a. All crew members shall direct the individual to the field supervisor/foreman.
  - b. The field supervisor/foreman will explain the program in a polite and professional manner.
  - c. If the field supervisor/foreman deems the situation requires additional assistance, the DPW representative shall be contacted immediately.
  - d. If a property owner demands operations cease, the field supervisor/foreman shall remove the crew and equipment from the property and contact the DPW's representative immediately.
  - e. If a non-property owner aggressively demands operations cease, the field supervisor/foreman shall cease operations and contact the DPW's representative immediately, but the crew does not need to leave the property unless it is deemed unsafe or unwise for them to remain.
  - f. The crew shall not return to that location until given clearance by the DPW.
  - g. If the situation is such that it is not easily resolved or the supervisor/foreman feels it is at least noteworthy, at a minimum, a narrative shall be include on the daily paperwork.

- g. Any resulting landowner agreements will be included in the DPW's permanent records and will be given to contractors as part of the bid package (the successful contractor(s) will need more exact information before maintenance activities begin).

### **Contract Compliance**

28. Failure to follow these operational guidelines is grounds for removal of the crew from the treatment site and potentially termination of the vegetation management contract.

## **6.3 REGULATIONS**

The DPW relies on independent contractors for vegetation management operations and requires, in a contractual agreement, that contractors comply with all applicable federal and state laws and regulations. Therefore, the following is only a partial list of pertinent federal, state and municipal laws and regulations (for example, contractor(s) shall also follow all OSHA and DOT laws and regulations and all regulations listed elsewhere in this VMP):

1. *Pertinent Pesticide Statutes and Regulations for Certified Commercial Supervisors and Arborists*. Also located at:  
[http://www.ct.gov/deep/lib/deep/pesticide\\_certification/supervisor/stats\\_regs\\_superv\\_and\\_arborists\\_rev\\_may\\_2008.pdf](http://www.ct.gov/deep/lib/deep/pesticide_certification/supervisor/stats_regs_superv_and_arborists_rev_may_2008.pdf)
2. *Guidelines for Disposal of Terrestrial Invasive Plants*. Also located at:  
<http://ccetompkins.org/resources/guidelines-for-disposal-of-terrestrial-invasive-plants-2011>
3. Connecticut Tree Laws (index)  
<http://www.ct.gov/deep/lib/deep/forestry/tableofcontentshyperlinked.pdf>
4. Connecticut Chapter 495, Endangered Species:  
[http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323486&deepNav\\_GID=1628](http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323486&deepNav_GID=1628)
5. South Windsor Inland Wetland/Watercourse and Conservation Regulations:  
[http://www.southwindsor.org/pages/swindsorct\\_planningdept/IWA%20Regs%20app%2010-18-00.pdf](http://www.southwindsor.org/pages/swindsorct_planningdept/IWA%20Regs%20app%2010-18-00.pdf)
6. South Windsor Code of Ordinances Chapter 46, Article II- Flood and Erosion Control Board:  
[https://www.municode.com/library/ct/south\\_windsor/codes/code\\_of\\_ordinances?nodeId=PTIICOOR\\_CH46FL](https://www.municode.com/library/ct/south_windsor/codes/code_of_ordinances?nodeId=PTIICOOR_CH46FL)
7. CT state Statutes, Chapter 477, Flood control and Beach Erosion, Section 25-84:  
[https://www.cga.ct.gov/current/pub/chap\\_477.htm](https://www.cga.ct.gov/current/pub/chap_477.htm)
8. U.S. EPA Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):  
<http://www.epa.gov/agriculture/lfra.html>
9. U.S. EPA Clean Water Act: <http://www2.epa.gov/laws-regulations/summary-clean-water-act>

## **6.4 NOTIFICATION**

The DPW will notify all easement owners before any non-emergency vegetation maintenance activities.

## **6.5 PAPERWORK**

The field supervisor/foreman must complete daily reports that fulfill the requirements set forth in the current Connecticut *Use of Pesticide* regulations, regardless of the type of vegetation maintenance activities. Any changes or additions to regulatory paperwork requirements will be followed in the future:

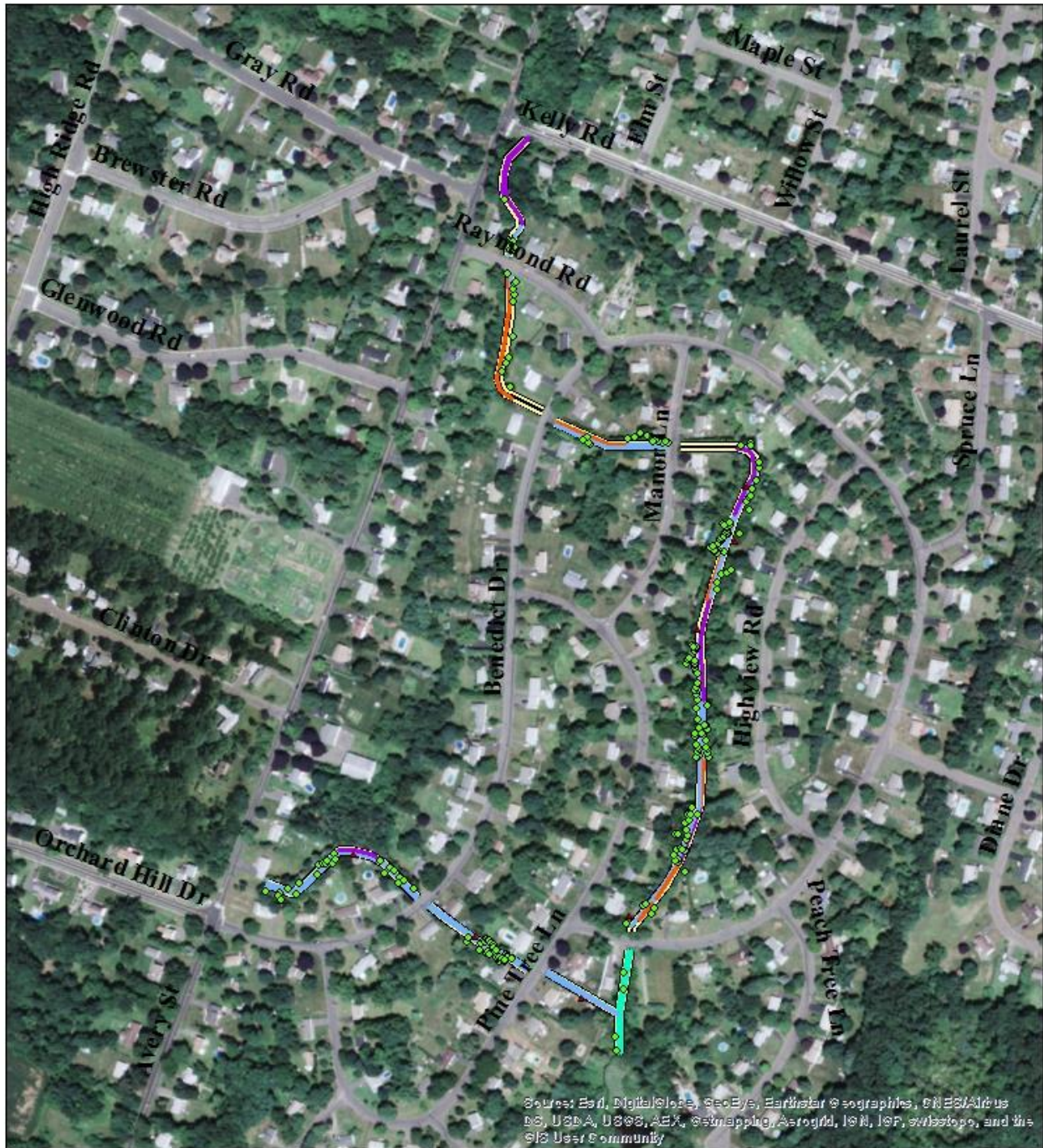
1. Date, name and address of vegetation management contractor(s)
2. Identification of site or work area
3. List of crew members (applicable licenses must be on file at the DPW, pesticide license numbers must be in the report)
4. Type of equipment and hours used, both mechanical and chemical
5. Application/Treatment method and description of target vegetation
6. If applicable, amount, concentration, product name of herbicide(s), adjuvants, and dilutants (EPA registration numbers must be on file)
7. Weather conditions (three times over the course of an 8-hour day)
8. Notation of any unusual conditions or incidents, including public inquiries
9. Record and/or verify of sensitive areas on storm drain map(s).

## **6.6 BASIC RESOURCES FOR MAINTENANCE CONTRACTORS**

1. VMP
2. Treatment Specification
3. RFP documentation
4. Treatment Maps
5. When necessary, as-Built Plan and Profile Drawings
6. New information gathered in the notification process
7. If any, Current Special Endangered, Threatened or Species of Special Concern Recommendations
8. Landowner Agreements.

## **APPENDIX 1: MAPS**





## Avery Heights: Avery Brook Channel Overview



1:5,000

0 125 250 500 750 1,000 Feet

Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016

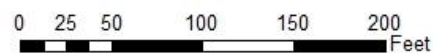
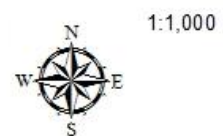




**Legend**

- Avery Street Storm Drain
- Yard Features
- Phase 2 Treatments**
  - Brush Mowing
  - Land Clearing
  - Land Clearing along Yard
  - Yard w/Shrubs
  - Tree Removals

# Avery Heights: Avery Brook Channel Map 1 of 7



Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016

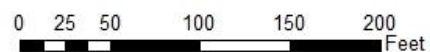


## Avery Heights: Avery Brook Channel

Map 2 of 7



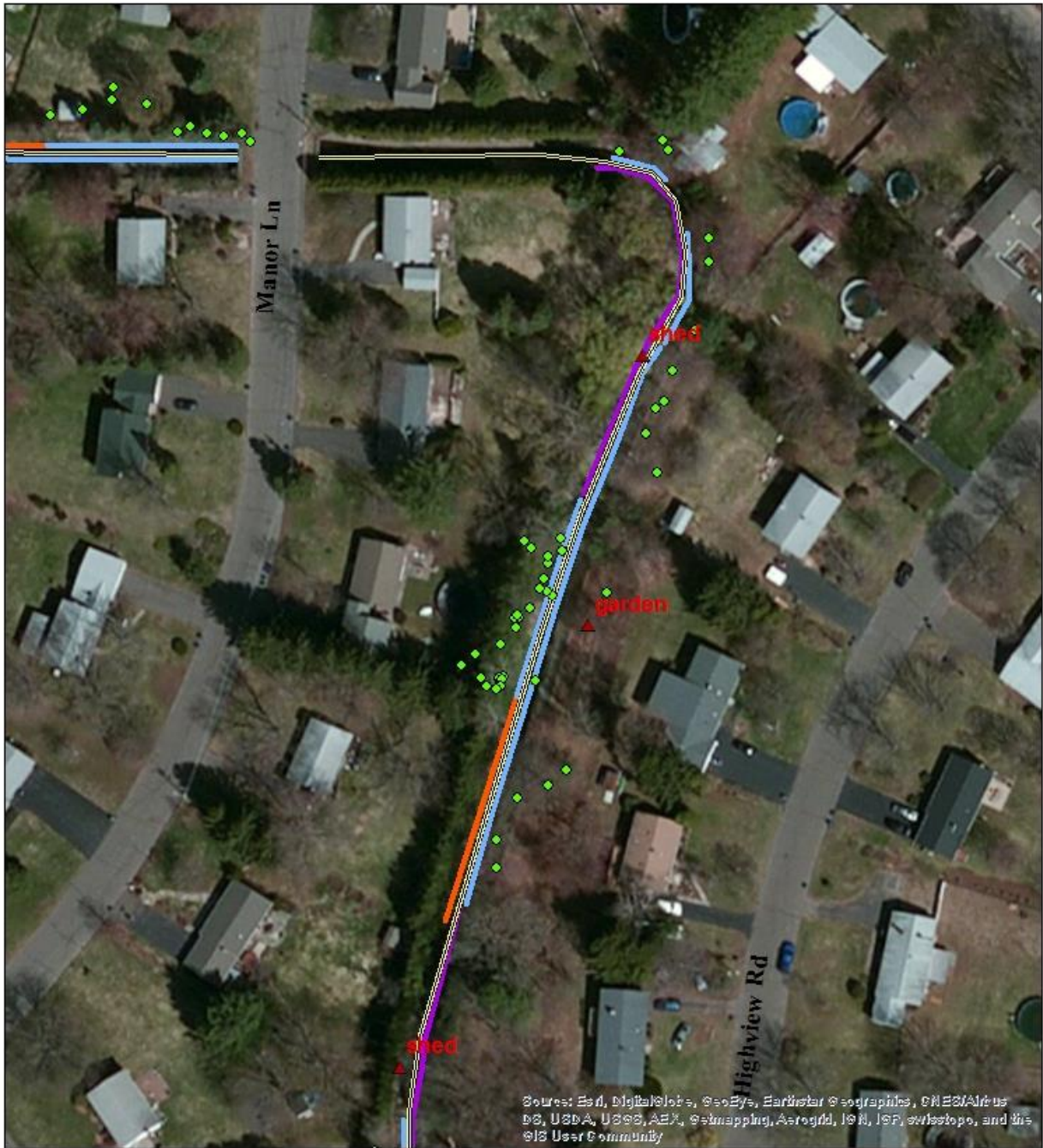
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Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016





**Legend**

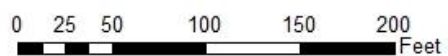
- Avery Street Storm Drain
- ▲ Yard Features
- Phase 2 Treatments**
  - Brush Mowing
  - Land Clearing
  - Land Clearing along Yard
  - Yard w/Shrubs
  - ◆ Tree Removals

## Avery Heights: Avery Brook Channel

Map 3 of 7



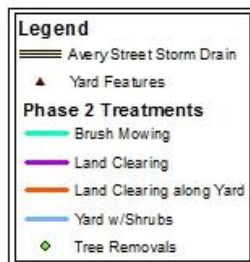
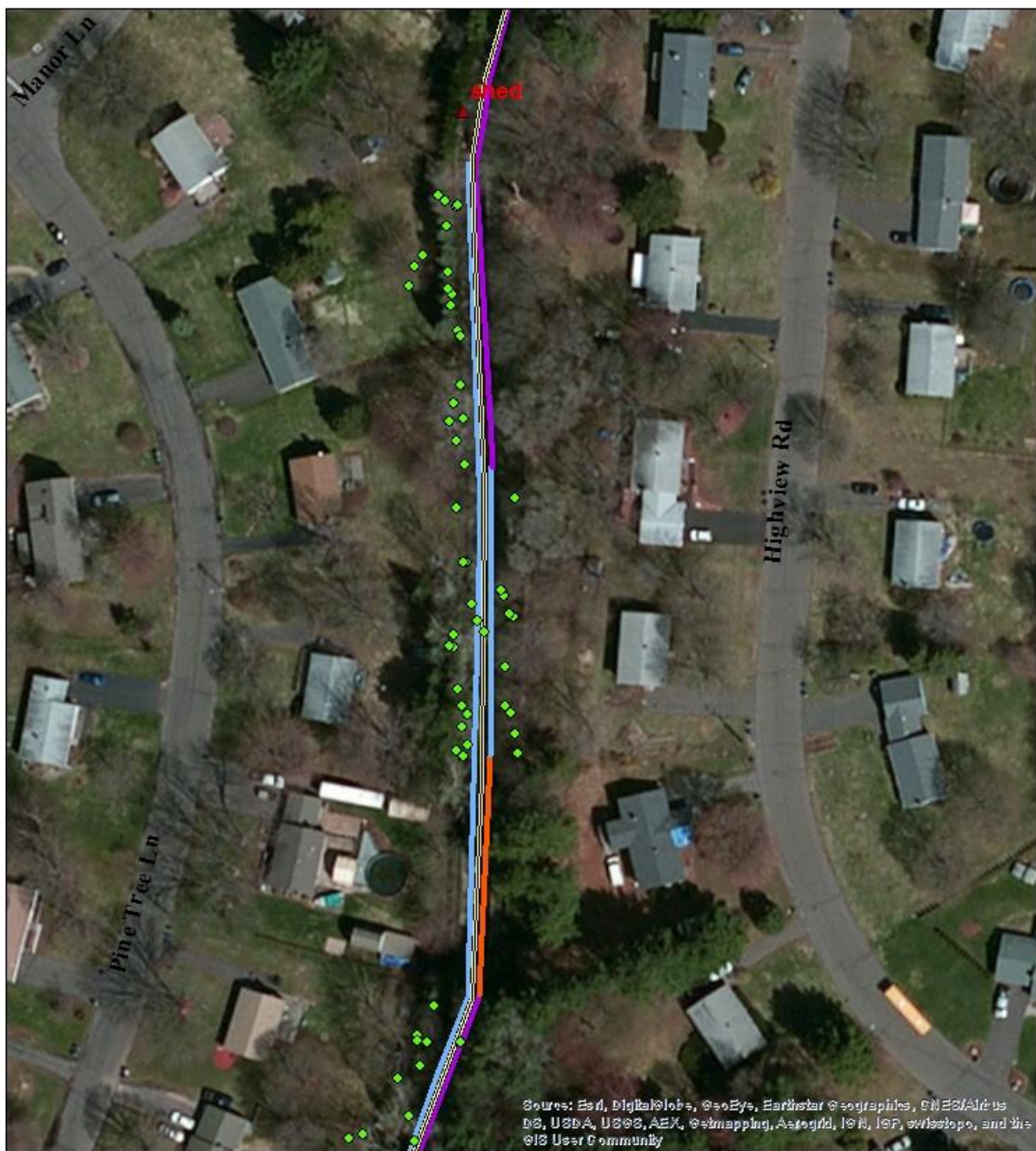
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Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016



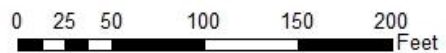


## Avery Heights: Avery Brook Channel

Map 4 of 7



1:1,000



Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016





## Avery Heights: Avery Brook Channel

Map 5 of 7



Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016



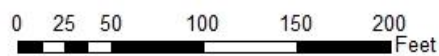


## Avery Heights: Avery Brook Channel

Map 6 of 7



1:1,000



Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016



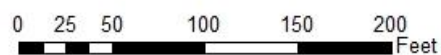


## Avery Heights: Avery Brook Channel

Map 7 of 7



1:1,000



Note: Treatment lines do not represent treatment widths. All treatment areas will be marked in the field before work commences.

July 27, 2016

## APPENDIX 2:

### LIST OF COMPATIBLE PLANT SPECIES\*

Rose of Sharon (Althea spp.)	Hydrangea
Andromeda (Pieris spp.)	Shrub Hollies
Viburnum spp.	Sweetspire (Itea)
Azaleas	Junipers (Low growing only)
Bayberry (Myrica)	Mountain Laurel (Kalmia)
Beach Plum	Leucothoe
Bearberry	Spicebush (Lindera)
Bluebeard (Caryopteris spp.)	Magnolia (Shrub Species)
Blueberry	Ninebark (Physocarpus)
Boxwood (Buxus spp.)	Birds Nest Spruce
Butterfly Bush	Dwarf Alberta Spruce
Buttonbush (Cephalanthus)	Purpleleaf Sand Cherry
Potentilla (Cinquefoil)	Rhododendron
Summersweet (Clethera spp.)	Roses
Sweetfern (Comptonia)	Elderberry (Sambucus)
Shrub Dogwood (Cornus)	Spirea spp.
Contoneaster	Shrub Lilac (Syringa spp)
Fothergilla	Weigela
Deutzia	